attaching the electrodes, record lead I If it shows muscle artifacts as evidenced by a wavy baseline resembling fibrillary waves, tell the patient to relax Check that the knees are not stiff Bend the knees slightly if they are stiff and ask the patient to move up into the bed about 2½ cm This maneuver relaxes the patient Check lead I again, usually the artifacts are no longer present If they are still present, ask the patient to shift back to his original position again reminding him to relax the body By this time muscle tension is invariably eliminated and the recording is now artifact-free and the baseline steady

This happens because just telling the patient to relax does not help him understand how to do it or communicate the feeling to him While moving up and down the bed, the patient recognizes the proper relaxed position of the body and thus when he repositions his body the mind translates the relaxed feeling into the muscles and the recording is "clean "

C V SHAH, MD
India House No 2
A B Godrej Chowk
Bombay 400036
India

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Comment

We agree that every effort should be made to obtain a good electrocardiogram with a "clear" baseline The clinical "tips" mentioned will be quite helpful, particularly the maneuver to reduce electromyographic noise We would like to point out, however, that the low noise electrocardiogram we described in our article differs from a routine electrocardiogram in several aspects The former has a much higher gain and a different filter setting and is concerned with identification of certain electrical signals (His-Purkinje and late potentials) of very small magnitude (1 to 20 μV) at the body surface The sources of noise in the recording include the electrode the electrode-surface interface, the amplifier, the power frequency interference and the electromyographic noise In addition to meticulous attempts to identify and reduce the various sources of noise, the low noise electrocardiogram also takes advantage of two other techniques to further reduce noise These are 1) spatial averaging from a number of surface electrodes, and 2) the use of a volume conductor electrode The theoretical and practical advantage of these two techniques in reducing noise has been discussed in a recent report (1) In particular, the volume conductor electrode helps to reduce the synchronous component of the electromyographic noise which seems to represent a major source of noise In this regard Shah's technique to get the patient to relax and reduce the muscle artifacts is most welcomed

NABIL EL-SHERIF, MD
RAHUL MEHRA, PhD
J A C GOMES, MD
GEORGE KELEN MD
Veterans Administration Medical Center
800 Poly Place
Brooklyn New York 11209

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